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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

— *of inventorship (Rule 4.17(iv)) for US only*

Published:

— *with international search report*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report: 1 July 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: NOVEL PROTEINS AND THEIR USES

(57) Abstract: The present invention provides nucleic acid sequences encoding novel human proteins. These novel nucleic acids are useful for constructing the claimed DNA vectors and host cells of the invention and for preparing the claimed nucleic acids, recombinant proteins and antibodies that are useful in the claimed methods and medical uses.

WO 2004/013281 A3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/19871

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12N 15/00, 15/85, 1/20; C07K 14/52; A61K 38/19, 39/395, 48/00
US CL : 435/69.52, 252.3, 320.1, 325, 6; 530/351; 424/85.1, 130.1; 536/23.1; 514/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 435/69.52, 252.3, 320.1, 325, 6; 530/351; 424/85.1, 130.1; 536/23.1; 514/44

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
STIC (sequences), STN (Medline, Biosis), EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	WO 01/49728 A2, (PROTROGENE, INC.) 12 July 2001, SEQ ID NO:36 and 56, pages 11-14, claims 1-6.	1-7 and 17 --- 20
X --- Y	TIAN, E. et al. Evi27 encodes a novel memberane protein with homology to the IL17 receptor. Oncogene, April 2000, 19:2098-2109, especially Figure 4, and page 2107, the right column.	1-7 and 17 --- 20

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
23 March 2004 (23.03.2004)

Date of mailing of the international search report
19 MAY 2004

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Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/19871

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-7,17, 20 in part directed to SEQ ID NO:1 and 2

Remark on Protest
☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-7, 17 part (f), and 20 in part, drawn to an isolated nucleic acid, a vector containing same, a host cell thereof, a method of recombinantly producing the encoded polypeptide, a composition comprising the nucleic acid, and an article thereof.

Group II, claim(s) 8-13, 17 part (a), 20 in part, drawn to an isolated polypeptide, a fusion protein thereof, a composition thereof, and an article thereof.

Group III, claim(s) 14-16, 17 part (d), and 20 in part, drawn to an antibody, a composition thereof, and an article thereof.

Group IV, claim(s) 17 part (b), and 20 in part, drawn to a composition comprising an agonist of an LP polypeptide, and an article thereof.

Group V, claim(s) 17 part (c), and 20 in part, drawn to a composition comprising an antagonist of an LP polypeptide, and an article thereof.

Group VI, claim(s) 17 part (e), and 20 in part, drawn to a composition comprising an anti-LP polypeptide-encoding mRNA specific ribosome, and an article thereof.

Group VII, claim(s) 18 and 21, drawn to a method of treatment using an LP polypeptide or agonist thereof.

Group VIII, claim(s) 19, drawn to a method of diagnosing a disease associated with an LP polypeptide.

Within each group listed above, there is more than one invention, which are not so linked as to form a single general inventive concept under PCT Rule 13.1, and they are listed below. In order for all inventions to be examined in one group, the appropriate additional examination fees must be paid.

Group A - SEQ ID NO:1 and 2,
Group B - SEQ ID NO:3 and 4,
Group C - SEQ ID NO:5 and 6,
Group D - SEQ ID NO:7 and 8,
Group E - SEQ ID NO:9 and 10,
Group F - SEQ ID NO:11 and 12,

Group G - SEQ ID NO:13 and 14,
Group H - SEQ ID NO:15 and 16,
Group I - SEQ ID NO:17 and 18,
Group J - SEQ ID NO:19 and 20,
Group K - SEQ ID NO:21 and 22,
Group L - SEQ ID NO:23 and 24.

The inventions listed as Groups I-VIII and Groups A-L do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

With respect to Groups I-VIII, the isolated the nucleic acid and the polypeptide encoded thereby in each invention are unrelated, each to each other as either is not itself an advance over the prior art because Kato et al. (WO200149728-A2) discloses nucleic acid comprising the present SEQ ID NO:1 with 96.8% sequence identity, and encoding a human polypeptide, which amino acid sequence is 96.8% identical to the present SEQ ID NO:2 (see computer printout of the search results). Thus, the Kato reference renders the present claims 1-3, for example, among the other, not novel. Therefore, the technical feature of the nucleic acid sequence is not special, and the groups do not share a special technical feature, and are not so linked by a single inventive concept under PCT Rule 13.1. Additionally, the other claimed products in groups III-VI are physically and/or functionally distinct chemical entities which share neither structure nor function. The claimed methods in groups VII and VIII are not a method of making or using the nucleic acid, and they are for different purposes, have distinct method steps, produce different products and/or different results, which are not coextensive and which do not share the same technical feature within the meaning of PCT Rule 13.2 so as to form a single general inventive concept.

With respect to Groups A-L, they are directed to different nucleic acid molecules and polypeptides encoded thereby. Each SEQ ID NO set forth above has distinct chemical, and structural properties, and therefore, each does not share a special technical feature with the other within the meaning of PCT Rule 13.2, and thus do not relate to a single invention concept within the meaning of PCT Rule 13.1.